



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,217	05/11/2001	Douglas E. Weiss	55944USA9A.002	6357
32692	7590	02/03/2004	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY			TSOY, ELENA	
PO BOX 33427			ART UNIT	
ST. PAUL, MN 55133-3427			PAPER NUMBER	
			1762	

DATE MAILED: 02/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/853,217

Applicant(s)

WEISS ET AL.

Examiner

Elena Tsoy

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 18-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2-5
- ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

***Response to Amendment***

Amendment filed on January 5, 2004 has been entered. Claims 1-22 are pending in the application. Claims 18-22 are withdrawn from consideration as directed to a non-elected invention.

***Claim Objections***

1. Objection to Claim 4 because of the informalities has been withdrawn.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Rejection of claims 1, 2, 5, 6, 8 under 35 U.S.C. 102(e) as being anticipated by Priou (US 6,590,009) has been withdrawn.
4. Rejection of claims 1-8, 10, 14, 15 under 35 U.S.C. 102(b) as being anticipated by WO 00/04055 has been withdrawn.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 1762

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1, 2, 5, 10-13, 16, 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Botman et al (Nuclear Instruments and Methods in Physics Research B 139).

As to claims 2, 5, 12, 16, 17, Botman et al disclose a method of heterogeneous polymerization in a single phase of monomer such as methyl methacrylate (MMA) applied (coated) to seed latex (substrate) using pulses of accelerated electrons at dose per pulse of 0.92 Gy at pulse rate of 25 Hz (pulse per sec) with a total dose of 1700 Gy (See page 493, paragraph 4.2, column 2). The total dose depends on the overall irradiation time and the dose per pulse (at a given pulse rate) (See page 492, column 1, paragraph 3, lines 1-3). Botman et al also teach that homogeneous polymerization of styrene requires total dose of 6700 Gy at a pulse frequency of 25 Hz and dose per pulse of 2.3 Gy (See page 493, column 1, paragraph 4.2, lines 1-5). Also pulses of 50 Hz and 3 Gy per pulse can be used for polymerization of a monomer (See Abstract). It is well known in the art that radiation polymerization of unsaturated compounds depends mainly on total dose, and the total dose (D) depends on pulse frequency (F), dose per pulse (dpp) and residence time (t), i.e.  $D = F \cdot dpp \cdot t$  or (dose rate)  $\cdot t$ . Therefore, in Botman et al, the total dose of 1700 Gy for polymerization of MMA at a pulse frequency of 25 Hz and dose per pulse of 0.92 Gy, should be achieved at  $t = 68$  sec, and the total dose of 6700 Gy at a pulse frequency of 25 Hz and dose per pulse of 2.3 Gy, should be achieved at  $t = 117$  sec.

However, Botman et al fail to teach that polymerization of styrene or MMA (the total dose) may be achieved using: a dose per pulse of about 10 to about 90 Gy (Claim 1) or about 10 to about 40 Gy (Claim 11) or of about 10 to about 30 Gy (Claim 13); a residence time of about 1.5 seconds to about 5 seconds (Claim 10).

Art Unit: 1762

It would have been also obvious to one of ordinary skill in the art at the time the invention was made to have achieved polymerization of MMA at a total dose of 1700 Gy at pulse frequency of 25 Hz using dose per pulse of 10 Gy with 6.8 sec of residence time; or using dose per pulse of 30 Gy with 2.3 sec of residence time; or using dose per pulse of 40 Gy with 1.7 sec of residence time, since  $D = F \cdot dpp \cdot t$ . For the same reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have achieved polymerization of styrene at a total dose of 6700 Gy in Botman et al at the same pulse frequency of 25 Hz, at only 2.98 sec of residence time using dose per pulse of 90 Gy, or at 26.8 sec of residence time using dose per pulse of 10 Gy; or at 8.93 sec of residence time by using dose per pulse of 30 Gy; or at 6.7 sec of residence time using dose per pulse of 40 Gy.

7. **Claims 2-4, 6-9, 14, 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Botman et al (Nuclear Instruments and Methods in Physics Research B 139) in view of WO 00/04055.

Botman et al, as applied above, fail to teach that the method can be used for polymerization of a composition comprising a monomer such as C<sub>8-13</sub> alkyl acrylate monomer (Claim 3) selected from the group consisting of isooctyl acrylate, 2-ethylhexyl acrylate lauryl acrylate and tridecyl acrylate (Claim 4); a comonomer (Claim 6) selected from the group consisting of acrylic acid, isobornyl acrylate, octylacrylamide and n-vinyl pyrrolidone (Claim 7); crosslinking agent (Claim 8); a thickener (Claim 9); the polymerizable composition is irradiated with the pulses at a temperature below 20 °C (Claim 14) for about the first 40% to 70% of the time period that the polymerizable composition is irradiated (Claim 15).

WO 00/04055 teach that a composition comprising a monomer such as C<sub>8-13</sub> alkyl acrylate monomer selected from the group consisting of isooctyl acrylate; 2-ethylhexyl acrylate lauryl

Art Unit: 1762

acrylate and tridecyl acrylate (See page 3, lines 27-32); a comonomer selected from the group consisting of acrylic acid, isobornyl acrylate, octylacrylamide and n-vinyl pyrrolidone (See page 7, lines 15-24); crosslinking agent (See page 8) and a thickening agent (See page 15, line 28) can be polymerized by varying dose rates of electron beam between 0.125-1 kGy/sec and timing the exposure to achieve total dose of 5-80 kGy (See pages 36, 37). WO 00/04055 further teaches that superior adhesive properties can be achieved by maintaining the temperature of the adhesive syrup between  $-80^{\circ}\text{C}$  and  $10^{\circ}\text{C}$  (See page 11, lines 3-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pulsed electron beam for irradiating a composition of WO 00/04055 with the expectation of providing the desired polymerization since Botman et al teach that pulses of 50 Hz and 3 Gy/pulse (i.e. dose rate of 150 Gy/sec) can be used for achieving total dose of e.g. 6700 Gy.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have irradiated a composition of WO 00/04055 with pulsed electron beam at a temperature below  $20^{\circ}\text{C}$  with the expectation of providing the desired superior adhesive properties, as taught by WO 00/04055.

### *Response to Arguments*

8. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

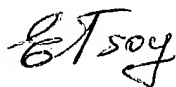
Art Unit: 1762

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (571) 272-1429. The examiner can normally be reached on Mo-Thur. 9:00-7:30, Mo-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for all communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Elena Tsoy  
Examiner  
Art Unit 1762

January 28, 2004